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ABSTRACT

In this study a model of the relationship between urbanization, school system variables and the sex composition of the teaching profession is developed. In the cross sectional analysis of data from 1870, the relationship between urbanization and the feminization of this occupation is explained in terms of length of the school year, the enrollment of a higher proportion of school age children, the more formalized control of the school, and the relative inexpensiveness of female labor. However, in a longitudinal analysis through the year 1875, it is shown that employers were not responding solely to the economic incentives of female labor, but rather, were influenced by past hiring patterns. The process through which the intermediate variables (length of year, percent enrolled, bureaucratization) and urbanization influenced feminization of the teaching profession is obscured since these factors are interrelated. (Author/GC)

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URBANIZATION, SCHOOL SYSTEM VARIABLES AND THE SEX COMPOSITION OF TEACHING: AN HISTORICAL VIEW

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ABSTRACT

This study develops a model of the relationship between urbanization, school system variables and the sex composition of teaching. In the cross-sectional analysis the relationship between urbanization and the feminization of the occupation is explained through the length of the school year, the enrollment of a higher proportion of school-age children and the more formalized control of the school. Also related was the relative inexpensiveness of female labor. However, in the longitudinal analysis it was found that employers were not responding solely to the economic incentives of female labor; past hiring patterns had the most effect on later hiring patterns. Urbanization also had an independent effect. But since the intermediate variables (length of year, percent enrolled, bureaucratization .) and urbanization share a good deal of the variance and are overlapping indices, the precise process through which they influenced feminization tends to be obscured. It is in this area where further research should be directed in an effort to disentangle the specific roles of bureaucratization and expansion of the educational system and its influence on the labor market factors.

INTRODUCTION

Occupational segregation of women is a form of economic discrimination which has affected a large majority of the female labor force for some time. But, why and how some occupations came to be dominated by one sex is still unclear. The purpose of this paper is to examine the largest and one of the most prestigious of female occupations--school teaching--at a point in time prior to its overwhelming domination by females in all regions of the country and subsequent label as "women's work."

It has been well established that economic discrimination against women occurs where there are heavy concentrations of female workers (Oppenheimer, 1970; Hodge and Hodge, 1965; Suter and Miller, 1973). These occupations include situations where males are underpaid relative to educational attainment (Treiman and Terrell, 1975) and where there is a need for relatively skilled but poorly paid labor (Treiman and Terrell, 1975; Oppenheimer, 1970).

However, the causal relationship between sex composition and income is unclear. For instance, Hodge and Hodge (1965) argue that women's entry into an occupation drives wages down. Others are concerned with the process of segregation (occupational discrimination) of women into lower paying jobs (Huber, 1973:763-6). Snyder and Hudis (1976) examined the factors thought to underlie the negative relationship between occupational incomes and concentrations of women and minorities. They found in their analysis (1950-1970) that the "most important structural source of the negative relationship . . . is the powerful over time stability in white male income and racial and sexual

composition." They concluded there is need for historical work on sources of this segregation.

Historically, there have been fluctuations in the sex composition of individual occupations and some occupations have even reversed their predominant composition from male to female or female to male (Oppenheimer, 1970: 116-20). Teaching is one of these occupations.

For instance, we know that teaching has been predominantly female (59%) since 1870 and this domination reached a high of 85.9% by 1920 (Ferris, 1969). We also know that fluctuation in the degree of occupational domination by females is characteristic of the 20th century (O'Connor, unpublished).

(Table I about here)

However, teaching was not predominantly female nor considered a woman's job during the Colonial period (Lortie, 1975:2; Donovan, 1938:2; Cubberly, 1920: 356-78) or just prior to the Civil War.[1]

EXPLANATIONS OF THE FEMINIZATION OF TEACHING

At least three explanations have been offered for the feminization of teaching in the 19th century. (1) One is the unavailability of traditionally preferred type of labor (male) and the substitution of females in an expanding occupation[2] (Oppenheimer, 1970; Donovan, 1938). (2) Another expalantion for the feminization of teaching is the result of pay differentials. The custom of paying women less than men for the same job was a common practice in the middle of the 19th century (Woody, 1929:494; Katz, 1968).

(3) Still another view is that urbanization is related to compulsory, bureaucratic, tax-supported, female dominant schools and that these fundamental structural characteristics were diffused throughout the country in a pattern roughly paralleling urbanization (Katz, 1971). However, the reasons for this are unclear.

These explanations are not necessarily mutually exclusive. In fact, we have tried to combine them in this study. Through a cross sectional analysis of 1870 data we examine the conditions under which the practice of employing females was most prevalent. We find in this analysis that the feminization of the occupation was greatest where there was more formalized control of teachers, difficulty in employing cheap native male labor, but not cheap female labor, a longer school year and a larger enrollment.

However, as interesting as this culling of hypotheses may be we know that the stability of variables over time is great (Bohrnstedt, 1969). Therefore we also perform a longitudinal analysis of the feminization of teaching. Here we find that urbanization and bureaucratization have small independent positive effects on the percent of female teachers in 1875.

THEORETICAL FRAMEWORK

A model of the factors encouraging the employment of females in 1870 is depicted in Figure 1. Developed primarily from the point of view of the employer, it utilizes the concept of constraints under which teachers must be hired by school systems and the organizational variables available for manipulation to meet this demand for labor.[3]

(Figure 1 about here)

A broad scale change over which employers had no control was urbanization. It affected the structure of the labor force, school attendance patterns and the length of the school year, as well as the ability to afford educational expenditures. As can be seen in Figure 1, the percent urban is included in the analysis.

Labor shortages in the traditionally preferred type of labor can lead to the substitution of females (Oppenheimer, 1970:116-20). One of the specific factors suggested as causing this demand for labor was the extension of the school year into agricultural seasons (Donovan, 1938; U. S. Commissioner of Education Report, 1870). This argument is plausible since almost fifty-two percent of the occupied males were in agriculture, and more than half of them as farmers and planters. This is further strengthened by the statistics on hiring practices during "summer" and "winter" terms. From a sample of schools in Massachusetts in 1840, only about 24% of the "winter" teachers were found to be females, while in total numbers females were in the majority (Katz, 1968:241).[4] Since men were needed on the farm, females were hired during the summer as teachers to replace those men teachers engaged in farming (Donovan, 1938:2).

In 1870 it was not uncommon for people to engage in more than one occupation, and the census makes note of this fact in a discussion of principal occupations.[5] For teaching, males, but not females, are consistently underreported in the census statistics as compared to the school statistics.[6] So we are suggesting teaching was becoming more female as the occupation changed from a secondary occupation in which men could engage part time for a few months of the year to a primary, full-time occupation. This suggests that

teaching as a full-time occupation for males was not as attractive as farming. In the analysis of the data, therefore, the length of the school year will be treated as a constraint under which the school system must engage labor.

Another factor creating a demand for labor was the expansion of public education over the 19th century (Katz, 1971; Lortie, 1975). This expansion occurred along two dimensions. One is the sheer numbers of students enrolled and the other is the proportion of the eligible population enrolled. The latter is felt to be more important as it demands proportionately more resources from the environment in the form of labor and money.[7] Thus, the size of the system is included as the percent of school-age children enrolled.

This increasing need for labor in the educational system coincided with changes in the economy which provided men with many profitable alternative opportunities in the expansion of commercial organizations, the frontier and farming. On the other hand, women, who accounted for 14.7 percent of all employed persons (U. S. Bureau of the Census, 1870), had few desirable options (Abbott, 1910; Oppenheimer, 1970), thereby forming a ready supply of labor. An index representing alternative opportunities for employment for literate women is included in the model. This index is considered as yet another constraint within which the educational system must operate.

Competing opportunities for females largely consisted of personal services, agricultural work as field hands, and factory work (U. S. Bureau of the Census, 1870). For better educated women,[8] we see in Table 2, the occupations of stenographer, typist, and telephone operator, predominantly female by 1900, were not yet largely developed nor were they "women's work" in 1870.

While nursing was overwhelmingly female, it was only one-eighth the size of the female teaching force. Librarians were enumerated in 1870 at a grant total of 43 (U. S. Bureau of the Census, 1870: Table LXV; U. S. Bureau of the Census, Occupations, 1900: Table I).

It would seem that indeed few desirable jobs besides teaching were available to literate women. However, movement by women between work in the mills and teaching is discussed by the Commissioner of Education (and Abbott (1910:119-120). This movement consisted both of teachers who gave up teaching for the year round wages in the mills and of teachers who were employed in the mills during the winter when men replaced women in the schools. Given these statistics and the discussion of movement between factory and school employment, manufacturing is included along with trade and transportation and professional services in an index representing alternative opportunities for employment for literate women.[9]

Other changes believed to have produced a reversal in the sex composition of an occupation involve shifts in the nature of a job due to technological cahnges (Oppenheimer, 1970:116).[10] But the assumption that changes in the nature of a job need to be technological is not necessary. Important changes in the role of the occupation or in its organizational context could produce a change in sex composition. Descriptions of the role of the teacher in one-teacher ungraded schools indicate that this role was different than the teacher role in the larger graded, urban schools (Lortie, 1975; Katz, 1971). Therefore, teachers per school is included in the analysis as representative of the more formalized control in graded schools

With larger schools both the teacher and student roles changed. More formalized control was attained by age-graded schools, prescribed courses of instruction by grade, larger school units and coordination by administrators. The relation between this change in control and the feminization of teaching is stated explicitly in the Commissioner of Education Report (1890-1:1058).

> While I like to see women in certain departments of graded schools, I think it unwise to employ women in ungraded schools. While women can instruct as well as men, I doubt whether they can properly govern a school or exert the proper educational influence over large boys and girls.[11]

Thus, control by male teachers was replaced by bureaucratic control.[12]

Besides the expanding educational system and the structure of the labor market in which the school must find teachers, the school system was further constrained by its resources in the form of tax monies.[13] Assuming a limited amount of money available with which to hire the necessary number of teachers, school authorities had considerable incentive to hire women since they could be paid less than men. The financial constraints under which a school system operated came not only from the competition for a large number of teachers, especially in an urban environment, but also from the extension of the number of months a school was in operation and the proportion of children enrolled. The opportunity to manipulate these variables is not very great. The authorities may not, when schools are public, overtly turn away children of the proper age nor reduce the length of the school year because of legislative and public prssure.[14] And since salaries comprised anywhere from 53% to 81% (U. S. Commissioner of the Education Report, 1890-91:28) of the educational expenditures, depending on the region of the country, salaries were one of the few important variables over which employers had any control. Thus we expect

the more expensive education became the more likely women were hired as a cheap source of labor.

METHODS AND DATA

With these characteristics of school systems in mind, we can examine the data for the present study. As stated previously, 1870 is the first year in which the census breaks down occupational statistics by sex. It is also the first opportunity to use nationwide statistics on state school systems compiled by the Department of the Interior. While state school systems are a gross measurement and no doubt hide differences within states, district level data are unavailable.[15]

The analysis proceeds in two parts using multiple regression and path analysis. First a cross sectional analysis of the determinants of the sex composition of teaching in 1870 is examined. The second part deals with a longitudinal analysis regressing the percent of female teachers in 1875 on the 1870 system variables controlling for percent female in 1870. Figure 1 and the discussion in the previous section describe why this specification is used.[16]

CROSS SECTIONAL ANALYSIS

Appendix A presents the zero-order correlation matrix, means and standard deviations for all variables in the study. Table 3 and Figure 2 present all standardized regression coefficients estimating average teacher's salary, teachers per school, male/female salary ratio and the sex composition of the occupation.

From the correlation matrix we see that the length of the school year and the percent enrolled are both fairly highly correlated with urbanization (.73, .52) and with each other (.49). By including them as separate variables it is possible to discern more precisely the characteristics of the relationship under study. In effect, it allows one to see the significantly different paths by which urbanization and the extent of the school system ultimately influence the feminization of the occupation.

(Figure 2 and Table 3 about here)

BUREAUCRATIZATION

In focusing on the variable directly representing bureaucratization, teachers per school, these independent relationships can be easily seen in Figure 2. Teachers per school is affected positively by the length of the year and the percent urban and negatively by the percent enrolled. In effect, when controlling for %URBAN, it becomes apparent that the larger the percent of school-age children enrolled in the schools, the more one-room schools there were.

The positive coefficient representing the length of the year is only slightly less than its correlation with teachers per school (.42). But this needs to be interpreted with caution. There was some discussion (Donovan, 1938; U. S. Commissioner of Education Report, 1970) of the need to hire more than one teacher if the school year extended into the agricultural season. In other words, on occasion, teachers rather than positions were counted and may constitute a spurious effect when claiming teachers per school to be representative of bureaucratization. The extent of this problem is open to

question. What is not questionable is that the longer the school year, the more teachers were needed, and the more teachers per school, the more likely females were to be hired. In fact, much of the total effect of the length of the year on percent female is indirectly through teachers per school (see Table 3). This is consistent with the idea that the extension of the school year was one opportunity for females to enter the occupation (Donovan, 1938; Abbott, 1910).

Increases in size generate pressures toward bureaucratization. This was especially true with the shift from very small (1 or 2 teachers) to larger schools where more formalized control was considered possible. With age grading, prescribed courses of instruction, less personalized contact with students and parents, and accountability to a supervisor, the role of the teacher changed. No longer was the teacher the sole director, enforcer and designer of the school and its procedures (Lortie, 1975). Feminization of teaching occurred as the occupation moved toward this depersonalized, bureaucratic context where control through a male figure was transferred to the bureaucracy. The extent of this effect is evident in unstandardized form. If the teachers per school increased by 1%, percent female increased by more than 12 (12.44).

SALARY

The other intervening variable, salary, is represented by two measures; average yearly salary and male/female salary ratio. We hypothesized that the higher the average salary, the greater the necessity for hiring lower paid labor. The average salary was expected to transmit some of the effects of greater urbanization and a longer school year. However, the small negative coefficient representing average salary does not support the hypothesis. It is plausible that it is not the level of salaries, but the effect of sub-

stitution of female for male salaries that is important. Women have long been a cheap source of labor (Oppenheimer, 1970; Abbott, 1910; Long, 1960; Katz, 1968).

The ratio of the two salaries, male and female, is the opportunity to manipulate the available revenue within which school systems were forced to operate, and should indicate the potential savings accruing to school systems with the employment of females. With this in mind, the male/female salary ratio is substituted for average salary and the variables predicting its value are examined.

Here we find that the most important cause of salary differentials between men and women was the provision of schooling to a large proportion of the school-age population. As the percent of children enrolled in the school system increased, it caused pressure on the limited total revenue available for salaries. Why this led to a greater salary differential is not clear. Further enquiry might be useful.

The opportunity for female employment in teaching can be seen clearly through the role of the male/female salary ratio. In unstandardized form, if the male salary were increased from one and one third to one and one half the female salary, it would increase the women teachers by almost two percent (1.89). Thus women's entrance into teaching represented an economy for a school system. However, the cheapness of female labor was not the only determinant of feminization. In fact, the zero-order correlation between male/female salary (.53) is reduced to a smaller (.24) but not unimportant role when the processes of urbanization, bureaucratization, greater acceptance of women into the labor force and a larger school system are controlled for.

Interestingly, while women's presence in other occupations that contained almost exclusively literate women in 1870 was not competicive enough to reduce the discrepancies in male and female wages, it did encourage the employment of women. In other words, once women were acceptable as employees in the labor force, women were more likely to be a large proportion of the teaching force as well.

SIZE OF SCHOOL SYSTEM

Having discussed bureaucracy and salaries next we turn to the size of the school system and its effect on female employment. Perhaps the direct and indirect paths through teachers per school and male/female salary ratio can be best understood in their unstandardized form, holding the other variables constant. For instance, if the percent of school-age children enrolled increased by two percent, the total effect would be to increase the percent female by almost 1 percent (.92). If the length of the school year were increased 1 month (20 days), it would increase the percent female by almost 2 percent (1.93).

Having examined the most interesting components of the model we turn to Katz's argument that feminization coincided with urbanization. These cross sectional results do not provide strong support for the direct explanation argued by Katz. While women have been found to be concentrated in urbanized

occupations (Treiman and Terrell, 1975; Oppenheimer, 1970) and urbanization has a .58 correlation with the percent female, Table 4 shows that .50 of this correlation can be explained indirectly through other variables. The percent urban has a positive effect on the percent female in 1870 because of urbanization's effect on the size of schools through the percent of children enrolled, the length of the year, and the accompanying changes in the bureaucratization of the system.

(Table 4 about here)

LONGITUDINAL ANALYSIS

We can examine this same model over time by regressing the percent of female teachers in 1875 on the system variables controlling for the percent of females in 1870. Here we see, not unexpectedly, the percent of females in 1870 is overwhelmingly the best predictor of percent female at the later time (see Table 5). The size of the school system, the comparatively lower paid female labor and the urbanization of the state have little effect. However, if all variables with less than a .08 standardized regression coefficient are dropped and the remaining variance examined, urbanization has a small independent effect on the percent female.

(Table 5 about here)

These longitudinal results now appear contradictory to the cross-sectional analysis. Yet, it is not uncommon for cross-sectional analysis of data to lead to inferences quite different from those suggested by longitudinal analysis. Two possible reasons for this are social inertia and the partialling fallacy.

Social inertia suggests that past hiring patterns are not as easily broken as one might assume. In fact, while as many as 49,000 additional teachers were hired in this five year period (1870-75) the proportion of female teachers increased less than 1 percent. The reasons for the slow change are evident from an examination of hiring patterns and how much change would be needed to substantially affect the percent female in 1875.

For instance, assume sex composition of the occupation is 50-50 in a given state, and quits and replacements are 50-50. If a district grew by one fourth and all new hires were women, the result would be a 10 percent change in the sex composition of the occupation (60-40). This drastic change in hiring practices and the large increase in numbers of teachers have only a modest effect on the proportion of teachers who are female. Thus, the sex composition of teaching necessarily changed very slowly.

Another reason for expecting a divergence of cross-sectional and longitudinal findings is the partialling fallacy (Gordon, 1968) where some variables share the same variance. Urbanization is a variable that has been globaly defined in terms of its relationship to education. The other variables highly correlated with urbanization are the length of the school year (.72) and the percent of school children enrolled (.52) as well as the number of teachers in a school (.42). In the cross-sectional analysis (see Table 4) it can be seen that these are the variables through which the correlation between urbanization and feminization of the occupation are explained and are to some extent over-lapping indices.

Urbanization's positive effect on the feminization of the occupation is indicated in the zero - order correlation (.57, .64). But a more interesting explanation of the relationship is evident in the indirect paths by which

urbanization ultimately influenced the feminization of the occupation. Specifically, the demand for labor created by the expansion of education to include more pupils and the extension of the school year increased the likelihood of hiring female teachers. The more formalized control of education by bureaucratic rules and regulations provided the opportunity to fill these labor demands within a social context (bureaucratic control) acceptable to the employer.

SUMMARY AND CONCLUSIONS

We started with the following arguments for the feminization of teaching. (1) Employment of females occurred with the expansion of the educational system because of the unavailability of the traditionally preferred type of labor (male). (2) The relative cheapness of female labor was an incentive to hire women. (3) And bureaucratization and feminization of the occupation followed urbanization. Our results show that these arguments are supported and not mutually exclusive.

We found support for the theory that labor shortages lead to substitution of less preferred workers, women. As the length of the school year increased it intruded into the agricultural season when men's labor was needed on the farm and women were hired as "summer" teachers. But both the length of the year and the percent of children enrolled in school also indicate a demand for labor created by the expansion of the educational system.

Again, the results lend support to the idea that women were a less expensive source of labor. The greater the salary differential between men

and women the greater the proportion of women of the total teaching force. The employment of women constitutes a potential savings for school authorities.

However, the results in the longitudinal analysis show that relatively less expensive female labor itself was not enough of an incentive to hire many more women than men between 1870 and 1875. In fact, by 1880 (see Table 1) the ratio of male to female salaries was at its greatest level and nationally the percent of teachers who were female declined from the previous ten year period. One might speculate that the 1880 figures represent an effort to retain, even at greater cost, the preferred labor source--males.

This longitudinal analysis suggests that employers were not responding solely to the economic incentives. In fact, Horace Mann felt it necessary to lay out very explicitly the cost benefits to be achieved by the employment of women. The context in which this economy was discussed included a system of district reorganization where smaller children would be taught by females and children over eight or ten years of age would be provided education in a central schoolhouse with a male teacher.[17]

We found in the cross sectional analysis that this organization and control of education through more formalized rules and regulations was another condition under which women were commonly hired. Thus we suggest that the sex composition of a job can change with a shift in the social context (bureaucratic control) of the job as well as with a change in its technological nature as Oppenheimer has argued.

If we take Katz to say urbanization caused feminization of teaching, we can claim the effect is not direct but accomplished through intermediate variables (length of year, percent of children enrolled in school, bureaucratization). This argument is supported in the predicted direction in both the

cross-sectional and the longitudinal results. Since these intermediate variables and urbanization share a good deal of the variance and are overlapping indices, the precise process through which they influenced feminization tends to be obscured. The results indicate that the three explanations for the feminization of teaching are not mutually exclusive. It is in this area where further research should be directed in an effort to disentangle the specific roles of bureaucratization and expansion of the educational system and its influence on the labor market factors.

APPENDIX A: MEANS, STANDARD DEVIATIONS AND CORRELATIONS OF VARIABLES

	X_0	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8
% FEMALE75 (X_0)									
% FEMALE 70 (X_1)	.969								
% URBAN (X_2)	.640	.577							
% ENROLL (X_3)	.717	.744	.525						
LENGTH OF YEAR (X_4)	.596	.549	.720	.495					
ALTERNATIVE OPPORTUNITIES (X_5)	.255	.278	-.040	-.016	-.151				
TEACHERS PER SCHOOL (X_6)	.342	.264	.415	-.042	.420	-.050			
AVE SALARY (X_7)	.355	.263	.411	.101	.421	.109	.384		
MF SALARY (X_8)	.485	.533	.196	.431	.241	.017	.018	-.043	
$\bar{X}$	55.06	54.35	21.35	60.6	111.11	8.33	1.39	232.59	1.37
STD. DEV.	17.70	17.86	17.70	21.8	41.28	12.23	.334	167.57	.38

N=35

Table 1: Growth of Educational System, 1870-1920.

Year	% Female	Total Teachers	% Elementary Teachers	Mean Days School Kept	% of School Age Population Enrolled	Total $ Expended For Schools	Monthly Average Male Salary	Monthly Average Female Salary
1870	59.0	200,515		132.2	57.0	$63,396,666	$45.55	$36.08
1880	57.2	286,593		130.3	65.5	78,094,687	48.73	35.62
1890	65.5	364,000*	97.5*	134.7	68.61	140,506,715	44.89	36.65
1900	70.1	423,000*	95.3*	144.3	72.43	214,964,618	47.55	39.17
1910	78.9	524,000*	92.0*	157.5	73.49	426,250,434	68.86	53.40
1920	86.0	678,000*	85.0*	165	75.57	605,460,785	82.35	64.72

Source: U. S. Commissioner of Education Report 1917:39 (1870-1910 Statistics).
Source: U. S. Commissioner of Education Report 1921:50 (1920 Statistics) except monthly average salary which is 1915)
*Source: Ferriss, Abbott, Indicators of Trends in American Education, 1969: 383-4.

TABLE 2: GROWTH OF THE LABOR FORCE IN SELECTED OCCUPATIONS, 1870-1900

1870	Females	% Female	1900	Females	% Female
Clerks, copyists, shorthand writers	254	4.2	Stenographers, typists and secretaries	86,154	76.6
Teachers	84,047	66.3	Teachers	327,586	74.5
Nurses (not specified)	10,170	92.7	Nurses (Trained)	11,134	93.6
			Telephone operators	15,349	80.0

1900 Source: Oppenheimer, Valerie, The Female Labor Force in the United States, 1970:151-2.
1870 Source: U. S. Bureau of the Census 1870: Table LXV.

TABLE 3: REGRESSION RESULTS: STANDARDIZED PARTIAL REGRESSION COEFFICIENTS, UNSTANDARDIZED PARTIAL REGRESSION COEFFICIENTS AND R^2's.

	DEPENDENT VARIABLE				
INDEPENDENT VARIABLE	TEACHERS PER SCHOOL	AVESALARY	%FEMALE70	MFSALARY	%FEMALE70
%URBAN	.3785 (.0071)*	.2088 (1.9767)*	.0428 (.0004)*	-.1320 (-.0028)*	.0728 (.0007)*
% ENROLL	-.4176 (-.6399)	-.1440 (-10.4639)*	.6675 (.5457)	.4586 (.8094)	.5584 (.4567)
LENGTH OF YEAR	.3568 (.0029)*	.2941 (1.1939)*	.1428 (.0006)*	.0909 (.0008)*	.1185 (.0005)*
ALTERNATIVE OPPORTUNITIES	.0127 (.0003)*	.1695 (2.3205)*	.3260 (.0048)	.0358 (.0011)*	.3160 (.0046)
TEACHERS PER SCHOOL		.1760 (88.1424)*	.2341 (.1249)	.05615 (.0646)*	.2192 (.1169)
AVESALARY			-.0081 (-.0000)*		
MFSALARY					.2403 (.1113)
a =	1.303	-17.388	-.077	.745	-.159
$\bar{R}^2$=	.324	.282	.751	.195	.797

*Unstandardized partial regression coefficients less than twice the standard error.

TABLE 4: EXPLANATION OF THE CORRELATION BETWEEN %URBAN AND %FEMALE. (.5774).

%URBAN	
DIRECT EFFECT	.0728
INDIRECT EFFECT THROUGH	
LENGTH OF YEAR	.1611
%ENROLL	.3004
ALTERNATIVE OPPORTUNITIES FOR LITERATE WOMEN	-.0133
TEACHERS PER SCHOOL	.0881
MFSALARY	-.0317
	.5774

TABLE 5: REGRESSION RESULTS: STANDARDIZED PARTIAL REGRESSION COEFFICIENTS, UNSTANDARDIZED PARTIAL REGRESSION COEFFICIENTS AND R^2's.

INDEPENDENT VARIABLE	DEPENDENT VARIABLE % FEMALE 75	% FEMALE 75	% FEMALE 75
% Female 70	.8845 (.8768)	.8970 (.8891)	.8993 (.8915)
% Urban	.0819 (.0008)*	.0952 (.0010)*	.1208 (.0012)
% Enroll	.0141 (.0114)*		
Length of year	.0231 (.0001)*		
Alternative Opportunities	.0191 (.0003)*		
Teachers per School	.0659 (.0349)*	.0650 (.0344)*	
MF Salary	-.0162 (-.0074)*		
a =	-.0020	-.0008	.0403
R^2 =	.953	.952	.949

*Unstandardized partial regression coefficients less than twice the standard error.

FIGURE 1: A MODEL OF THE DETERMINANTS OF THE SEX COMPOSITION OF TEACHIN

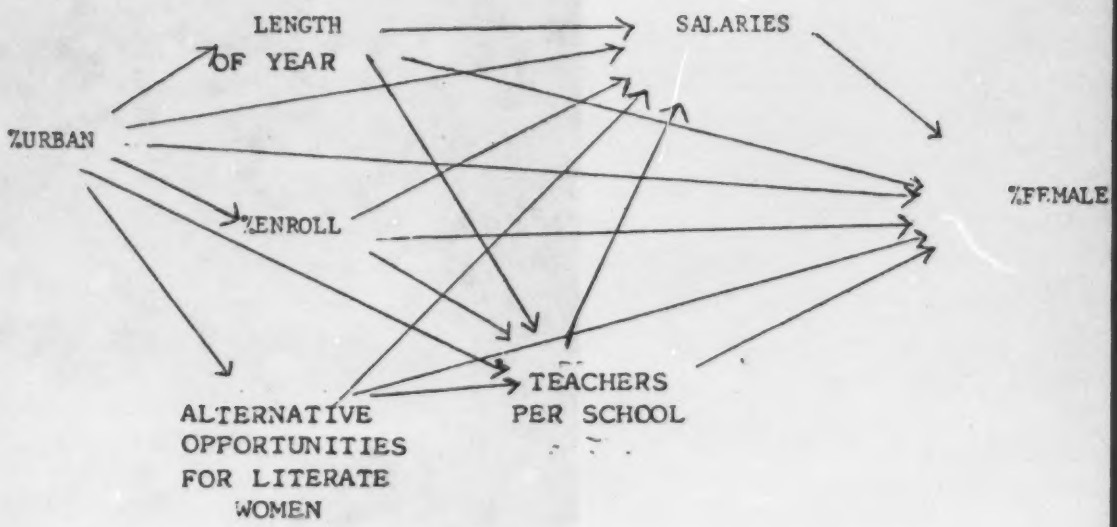
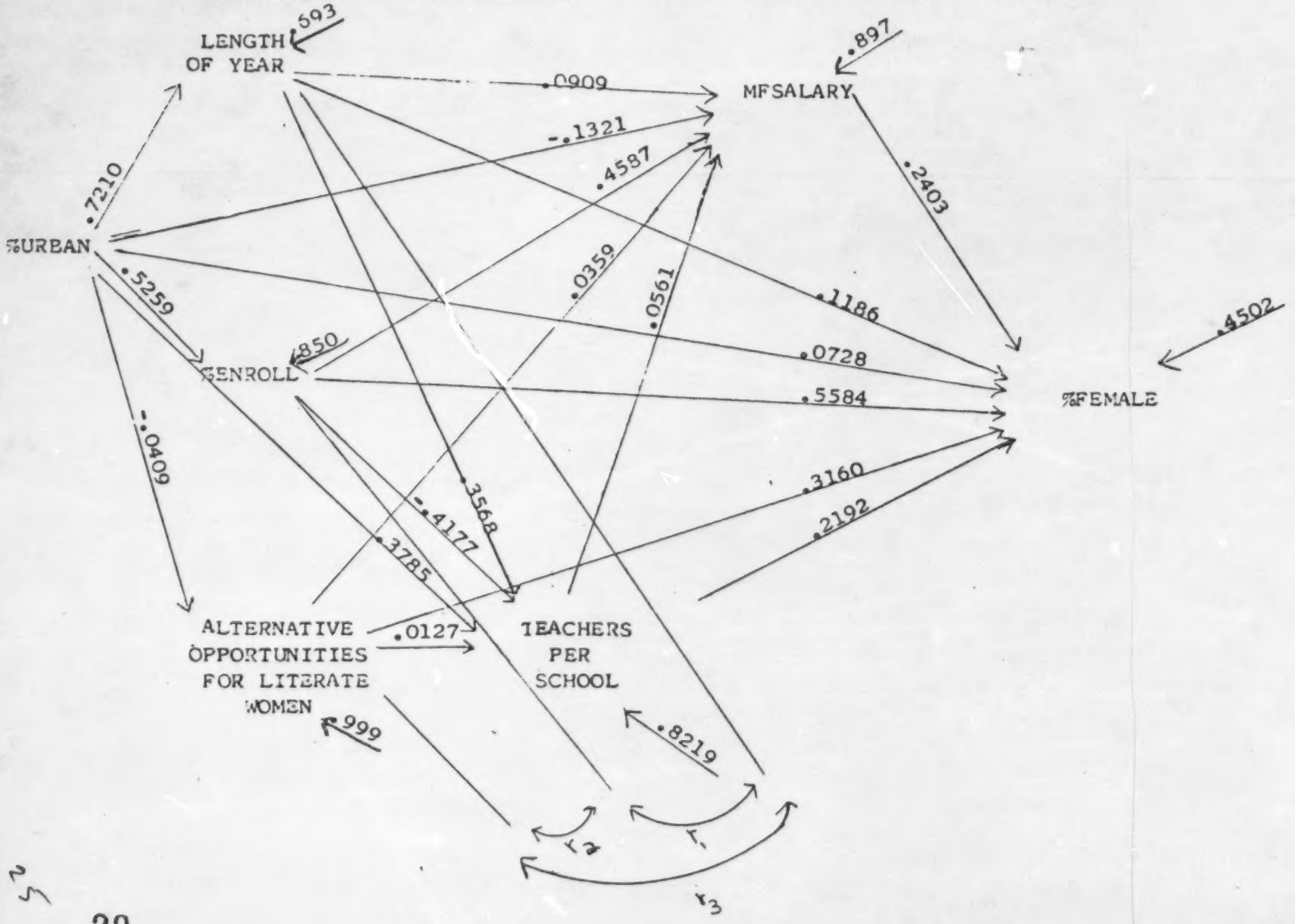


FIGURE 2: PERCENT FEMALE AS A FUNCTION OF MALE/FEMALE SALARY RATIO, TEACHERS PER SCHOOL, PERCENT OF SCHOOL AGE CHILDREN ENROLLED, LENGTH OF YEAR, ALTERNATIVE OPPORTUNITIES FOR LITERATE WOMEN AND PERCENT URBAN.



FOOTNOTES

1. For instance, in Delaware in 1852 it was reported that, "They commenced by employing male teachers" (U. S. Commissioner of Education Report, 1870). And in Missouri in 1855, after 16 years of common schools, there were four times as many men as women and that increased to five times as many men by 1858 (U. S. Commissioner of Education Report, 1900). There are no complete national statistics for teachers by sex available before 1870 either in the U. S. Census or in the U. S. Commissioner of Education Report.

2. The Civil War has been suggested as an opportunity for women to enter teaching (Petersen, 1964; Epstein, 1971). But there are states that employed women as a major proportion of their teaching staff before the Civil War and while the few statistics that are available show women replacing men in 1864 and 1865 men reenter the occupation immediately after the war and continue to maintain and often increase their absolute numbers (U. S. Commissioner of Education Report, 1870). Women's entrance into the labor force during time of war has not had a long term effect on the sex composition of occupations (Oppenheimer, 1970).

3. Constraints on employers is a point of view that is consistent with Oppenheimer's (1970) argument regarding labor shortages affecting employers' use of preferred labor and Donovan's (1938) suggestion that teaching was a part-time job for males since as the school year lengthened it became increasingly difficult to employ males for the full term. It is also compatible with Katz's (1968) conclusion that employment of females represented an educational economy to a school system.

4. No definition of "summer" or "winter" is available. But where it is reported as such in 1870 (U. S. Commisioner of Education Report), "winter" is consistently a longer term and enrolls more children as well as hiring more males than the "summer" term. When compiled by state, the highest number of men and the highest number of women are tabulated resulting in a count of teachers rather than positions.

5. "It must be borne in mind that the number of persons who are reported under a certain specified occupation does not necessarily embrace all the persons who perform the duties usually associated with that title, but only those who discharge such duties to the exclusion of other gainful occupations, or, at least, as their principal or sole professed means of support." It is common to find on the returns dual entries such as farmer and carpenter, etc., but only one occupation may be counted. "The same general process occurs in . . . professional employment" (U. S. Bureau of the Census 1870:617).

6. Reference to occupational statistics in the census reports teachers as 65.7% female, while reference to the Commissioner of Education reports teachers as 59% female in 1870.

7. Between 1840 and 1890 the school-age population increased four times, but the school enrollment increased seven times (Folger and Nam, 1967:3).

8. Most school teachers had only six or eight years of elementary education, but relative to the general population where illiteracy was still prevalent enough to be counted in the census and a fair-sized immigrant population existed, eight years or more of schooling and facility with the English language qualified one as educated (Oppenheimer, 1970).

9. The census figures on literacy by occupation show that professional services, trade and transportation and manufacturing all employed fewer than five percent of their female labor as illiterates in 1890, the first time a literacy by occupation rate was reported (U. S. Bureau of the Census, 1890: Table 98). It was noted by Abbott (1910) that the mills were employing an increasing number of illiterates and immigrants in the late 19th and early 20th century. Thus it seems likely that a 5% illiteracy rate in manufacturing occupations in 1890 was higher than the rate in 1870.

10. Oppenheimer discusses the invention of the typewriter as an opportunity for women to enter the clerical field, possibly displacing the male occupation of copyist. Another example of change of sex composition of an occupation is the introduction of the power loom with males displacing females (1970:116-8).

11. Available statistics consistently (37 out of the 39 states reporting) show males comprising a larger proportion of teachers in ungraded than graded situations (U. S. Bureau of the Census, 1870:Table XXXIV).

12. Whether or not the change to a more formal hierarchial structure actually exerted more control over teachers or whether the symbolic nature of the formal structure was more important could be argued (see Meyer and Rowan, 1977).

13. Local taxation of property holdings was incorporated into the common school system during the 19th century and this held down levels of expenditures. Prior to this, a variety of financial schemes from private tuition to charity schools supported by philanthropic associations were common (Cuberley, 1920: 676-708).

14. This was an era of agitation for compulsory school attendance laws (U. S. Commissioner of Education Report, 1917:42). In 1870, public pressure was probably more intense than the laws which were on the books. Nine states by 1870, and 17 by 1880, had such laws.

15. Two problems exist with the 1870 Commissioner of Education data: estimated and missing data. Estimated data appear scattered across variables and across states with no one state or variable consisting entirely of estimated data. Missing data reduces the states and territories from 46 to 35. These states are not concentrated in any one region of the country and represent a substantial range in size.

16. The variables and their operationalization are as follows:
The percent of teachers who are female in 1875 is a dependent variable and was computed from the number of female teachers divided by the total number of teachers reported in the U. S. Commissioner of Education Report (1875: Table).
The percent of teachers who are female in 1870 is the dependent variable and was computed from the number of female teachers divided by the total number of teachers reported in the U. S. Commissioner of Education Report (1890-1: Table 5).
The proportion of the state that was urban in 1870 was taken from the U. S. Bureau of the Census, Census of Population, PT.A, Characteristics of the Population: Table 20, 1960.
The rate of the enrollment in 1870 was measured by the number of school-age children enrolled during the year divided by the school-age population of the state (U. S. Commissioner of Education Report, 1890-1: Table 2 and 1870: Table 1). While there are discussions as to the reliability of the number of enrolled children, in that they were reported on the high side, it seems this is a uniform problem throughout the country.
The extent of alternative employment opportunities for literate females in 1870 were measured by the ratio of the number of employed females age 10 and over in trade and transportation, manufacturing and professional services (U. S. Bureau of the Census, 1870: Table LVIII), excluding teachers, to the number of employed female teachers as reported in the Commissioner of Education Report (1890-1: Table 5). Professional and personal services in the 1870 Census were separated using the 1890 Census categories.
The teachers per school in 1870 was computed from all teachers divided by all schools (U. S. Bureau of the Census, 1870: Table XXXIV).
The average salary in 1870 for all teachers was computed from the total teachers' salary expenditures divided by the total number of teachers (U. S. Commissioner of Education Report, 1890-1: Table 6 and Table 5).
The male/female salary ratio in 1870 was computed from the average monthly male and female salary (U. S. Commissioner of Education Report, 1890-1: Table 6).

17. It seems not unconnected with this subject to inquire, whether, in many places out of our cities, a plan may not be adopted to give greater efficiency to the means, now devoted to common-school education. The population of many towns is so situated as conveniently to allow a gradation of the schools. For children under the age of eight or ten years, about a mile seems a proper limit, beyond which they should not be required to travel to school. On this supposition one house, as centrally situated as circumstances will permit, would accommodate the population upon a territory of four square miles, or, which is the same thing, two miles square. But a child above that age can go two miles to school, or even rather more, without serious inconvenience....Supposing, however, the most remote scholars to live only at about the distance of two miles from the school, one house will then accommodate all the older children upon a territory of about sixteen square miles, or four miles square. Under such an arrangement, while there were four schools in a territory of four miles square.....for the younger children, there would be one central school for the older. Suppose there is $600 to be divided amongst the inhabitants of this territory or $150 for each of the four districts Suppose farther, that the average wages for male teachers is $25, and for female $12.50 per month. If, according to the present system, four male teachers are employed for the winter term and four female for the summer, each of the summer and winter schools may be kept four months. The money would then be exhausted;i. e.four months summer, at 12.50=$50, and four months winer, at$25=

$100;-both=$150. But according to the plan suggested , the same money would pay for six months, summer school, instead of four, in each of the four districts, and for a male teacher's school eight months at $35 a month, instead of four months at $25 a month, and would then leave $20 in the treasury (Mann,1837: 30-31). We want to thank Chris tine Shea for calling our attention to this citation.

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